WHAT IS CLAIMED:

1. Molybdenum metal made according to the process comprising heating a precursor material to a first temperature in the presence of a reducing gas, increasing said first temperature at least once to reduce said precursor material and form said molybdenum metal, and cooling said molybdenum metal at a substantially constant pressure.

2. Molybdenum metal characterized by a surface area of substantially 2.5 m^2/g according to BET analysis.

3. Molybdenum metal characterized by a substantially uniform size as detected by scanning electron microscopy.

4. Molybdenum metal as in claim 3, wherein said molybdenum metal is a reduced form of nano-particles of molybdic oxide (MoO_3).

5. Molybdenum metal made according to the process comprising heating a precursor material at a constant pressure to a first temperature in the presence of a reducing gas, and increasing said first temperature at least once to reduce said precursor material and form said molybdenum metal.

6. A method for producing molybdenum metal, comprising heating a precursor material to a first temperature in the presence of a reducing gas, said first temperature being in a range of about 540°C to about 600°C, increasing said first temperature at least once to reduce said precursor material and form said molybdenum metal, and cooling said molybdenum metal at a substantially constant pressure.

7. The method of claim 6, wherein said first temperature is increased to a second temperature in a range of about 760°C to about 820°C.

8. The method of claim 7, wherein said second temperature is increased to a third temperature in a range of about 980°C to about 1050°C.

9. The method of claim 6, wherein said first temperature is increased to a second temperature of about 750°C.

10. The method of claim 6, wherein said first temperature is increased to a second temperature in a range of about 750° to about 820°C.

11. The method of claim 10, wherein said second temperature is increased to a third temperature of about 850°C.

12. The method of claim 10, wherein said second temperature is increased to a third temperature in a range of about 850°C to about 1050°C.

13. A method for producing molybdenum metal, comprising heating a precursor material at a constant pressure to a first temperature in the presence of a reducing gas, said first temperature in a range of about 540°C to 600°C, and increasing said first temperature at least once to reduce said precursor material and form said molybdenum metal.

14. The method of claim 13, wherein said first temperature is increased to a second temperature in a range of about 760°C to about 820°C.

15. The method of claim 14, wherein said second temperature is increased to a third temperature in a range of about 980°C to about 1050°C.

16. The method of claim 13, wherein said first temperature is increased to a second temperature of about 750°C.

17. The method of claim 13, wherein said first temperature is increased to a second temperature in a range of about 750°C to about 820°C.

18. The method of claim 17, wherein said second temperature is increased to a third temperature of about 850°C.

19. The method of claim 17, wherein said second temperature is increased to a third temperature in a range of about 850°C to about 1050°C.

20. Molybdenum metal characterized by a surface area in a range of about 2.1 m^2/g to about 4.1 m^2/g according to BET analysis.

21. An apparatus for producing molybdenum metal from a precursor material, comprising:

a furnace having at least two heating zones;

a process tube extending through each of said at least two heating zones of said furnace, said process tube having an inclination in a range of about 0.2° to about 0.4°, said process tube having a substantially constant pressure, wherein said precursor material is introduced into said process tube and moved through each of said at least two heating zones of said furnace; and

a process gas introduced into said process tube, wherein said precursor material reacts with said process gas within said furnace to form said molybdenum metal.

22. The apparatus of claim 21, wherein said process tube is at an inclination of about 0.3°.

23. The apparatus of claim 21, further comprising a feed system linked to said process tube, wherein said precursor material is introduced into said process tube at a rate of about 9 grams per minute.

24. The apparatus of claim 21, further comprising a feed system linked to said process tube, wherein said precursor material is introduced into said process tube at a rate of about 5 grams per minute.

25. The apparatus of claim 21, further comprising a feed system linked to said process tube, wherein said precursor material is introduced into said process tube at a rate in a range of about 5 grams per minute to about 9 grams per minute.

26. An apparatus for producing molybdenum metal from a precursor material, comprising:

a process tube having three heating zones and a cooling zone, said process tube having an inclination in a range of about 0.2° to about 0.4°, wherein said precursor material is introduced into said process tube and moves through said three heating zones; and

a process gas introduced into said process tube, wherein said precursor material reacts with said process gas to form said molybdenum metal in said three heating zones, said molybdenum metal cooling at a constant pressure in said cooling zone.

27. The apparatus of claim 26, wherein said process tube is at an inclination of about 0.3°.

28. The apparatus of claim 26, further comprising a feed system linked to said process tube, wherein said precursor material is introduced into said process tube at a rate of about 9 grams per minute.

29. The apparatus of claim 26, further comprising a feed system linked to said process tube, wherein said precursor material is introduced into said process tube at a rate of about 5 grams per minute.

30. The apparatus of claim 26, further comprising a feed system linked to said process tube, wherein said precursor material is introduced into said process tube at a rate in a range of about 5 grams per minute to about 9 grams per minute.